WHAT IS CLAIMED IS:

1. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in a reverse order to each other; and

transmitting the generated frame data, and

at a receiving side,

receiving the frame data;

assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result.

2. The data transmission method as claimed in claim 1, wherein

at the transmitting side,

if the number of bits of the transmitted data is zero, said step of calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

at the receiving side,

said step of calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said step of deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

3. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the corresponding transmitted data, and bit arrangements of the transmitted data and of the error-detecting code are set in the same order; and

transmitting the generated frame data,

wherein if the number of bits of the transmitted data is zero, said step of calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

at the receiving side,

receiving the frame data;

assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein said step of calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero is also assumed as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern said step of deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

4. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged ahead of the corresponding transmitted data; and

transmitting the generated frame data,

wherein if the number of bits of the transmitted data is zero, said step of calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

at a receiving side,

receiving the frame data;

assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein said step of calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said step of deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

5. The data transmission method as claimed in any one

of claims 1-4, further comprising the steps of:

at the transmitting side,

conducting error-correcting coding of the generated frame data; and

conducting interleaving of the frame data that has undergone the error-correcting coding, and

at the receiving side,

conducting deinterleaving of the received frame data; and

conducting error-correcting decoding of the frame data that has undergone the deinterleaving.

6. The data transmission method as claimed in claim 5, wherein

at the transmitting side,

said step of generating the frame data generates the frame data containing a tail bit; and

said step of conducting the error-correcting coding conducts the error-correcting coding with a convolutional code, and

at the receiving side,

said step of conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final

bit position, calculates a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence, and

said step of deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data.

7. The data transmission method as claimed in claim 6, wherein at the receiving side, the predetermined range regarding the likelihood difference at said step of deciding depends on the assumed final bit position of the frame data.

8. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

generating frame data containing the

transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged after the corresponding transmitted data, and at the same time bit arrangements of the transmitted data and of the error-detecting code are set in the same order;

conducting error-correcting coding of the generated frame data with a convolutional code;

conducting interleaving of the frame data that has undergone the error-correcting coding; and

transmitting the frame data that has undergone the interleaving, and

at a receiving side,

receiving the frame data;

conducting deinterleaving of the received frame data;

assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at the assumed final bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

assuming the transmitted data and the

error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference at said step of deciding depends on the assumed final bit position of the frame data.

9. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

generating frame data containing the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged

ahead of the corresponding transmitted data;

conducting error-correcting coding of the generated frame data with a convolutional code;

conducting interleaving of the frame data that has undergone the error-correcting coding; and

transmitting the frame data that has undergone the interleaving, and

at a receiving side,

receiving the frame data;

conducting deinterleaving of the received frame data;

assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed

transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference at said step of deciding depends on the assumed final bit position of the frame data.

10. The data transmission method as claimed in any one of claims 6~~9~~, further comprising the step of:

at the transmitting side,

calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame,

wherein said step of generating the frame data generates the frame data containing the calculated transmission rate information, and

at the receiving side,

wherein both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code assume the final bit position of the

frame data on the basis of the transmission rate information in the received frame data.

11. The data transmission method as claimed in claim 10, wherein at the transmitting side, said step of conducting the error-correcting coding conducts, for the transmission rate information, independent error-correcting coding that is separate from the error-correcting coding for the transmitted data, the error-detecting code, and the tail bit.

12. The data transmission method as claimed in claim 11, wherein at the transmitting side, said step of conducting the error-correcting coding conducts the error-correcting coding of the transmission rate information by using a block code.

13. The data transmission method as claimed in claim 10, wherein at the transmitting side, said step of conducting the error-correcting coding conducts the error-correcting coding of all of the transmission rate information, the transmitted data, the error-detecting code, and the tail bit collectively with a convolutional code.

14. The data transmission method as claimed in any one of claims 10-13, wherein at the receiving side, if said step of deciding does not decide that the final bit position

of the frame data assumed on the basis of the transmission rate information in the received frame data is the final bit position of the frame data, both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data.

15. The data transmission method as claimed in any one of claims 6~~-12~~4, wherein at the receiving side, if among the assumed final bit positions of the frame data exist a plurality of positions where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data, said step of deciding decides that a position where the obtained likelihood difference becomes the minimum is the final bit position of the frame data.

16. The data transmission method as claimed in claim 5, further comprising the step of:

at the transmitting side,

calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame,

wherein said step of generating the frame data

generates the frame data containing the calculated transmission rate information and a tail bit, and

said step of conducting the error-correcting coding conducts the error-correcting coding with a convolutional code, and

at the receiving side,

wherein said step of conducting the error-correcting decoding assumes the final bit position of the frame data on the basis of the transmission rate information in the received frame data, frame by frame, for the received frame data, and conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and

said step of calculating the error-detecting code assumes the final bit position of the frame data on the basis of the transmission rate information in the received frame data.

17. The data transmission method as claimed in claim 16, wherein

at the receiving side, if said step of deciding does not decide that the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data is the final bit position of the frame data,

said step of conducting the error-correcting decoding assumes the final bit position of the frame data,

frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said step of deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data.

18. The data transmission method as claimed in claim 17, wherein at the receiving side, the predetermined range regarding the likelihood difference at said step of

determining depends on the assumed final bit position of the frame data.

19. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame;

generating frame data containing the calculated transmission rate information, the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in the same order;

conducting error-correcting coding of the generated frame data with a convolutional code;

conducting interleaving of the frame data that has undergone the error-correcting coding; and

transmitting the frame data that has undergone the interleaving, and

at a receiving side,

receiving the frame data;

conducting deinterleaving of the received frame data;

assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position;

assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code, first, assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said step

of deciding does not decide that the assumed position is the final bit position of the frame data,

said step of conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates the likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and the likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said step of deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the likelihood difference at said step of deciding depends on the assumed final bit position of the frame data.

20. A data transmission method that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising the steps of:

at a transmitting side,

calculating an error-detecting code of the transmitted data, frame by frame;

calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame;

generating frame data containing the calculated transmission rate information, the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged ahead of the corresponding transmitted data;

conducting error-correcting coding of the generated frame data with a convolutional code;

conducting interleaving of the frame data that has undergone the error-correcting coding; and

transmitting the frame data that has undergone the interleaving, and

at a receiving side,

receiving the frame data;

conducting deinterleaving of the received

frame data;

assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position;

assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

acquiring the transmitted data on the basis of said decision result,

wherein both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code, first, assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said step of deciding does not decide that the assumed position is

the final bit position of the frame data,

said step of conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates the likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and the likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said step of conducting the error-correcting decoding and said step of calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said step of deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the

likelihood difference at said step of deciding depends on the assumed final bit position of the frame data.

21. The data transmission method as claimed in any one of claims 17-20, wherein at the receiving side, if among the assumed final bit positions of the frame data exist a plurality of positions where the obtained likelihood difference is within the predetermined range and at the same time the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data, said step of deciding decides that a position where the obtained likelihood difference becomes the minimum is the final bit position of the frame data.

22. The data transmission method as claimed in any one of claims 16-21, wherein at the transmitting side, said step of conducting the error-correcting coding conducts, for the transmission rate information, independent error-correcting coding that is separate from the error-correcting coding for the transmitted data, the error-detecting code, and the tail bit.

23. The data transmission method as claimed in claim 22, wherein at the transmitting side, said step of conducting the error-correcting coding conducts the error-correcting coding of the transmission rate information by using a block code.

24. The data transmission method as claimed in any one of claims 16-21, wherein at the transmitting side, said step of conducting the error-correcting coding conducts the error-correcting coding of all of the transmission rate information, the transmitted data, the error-detecting code, and the tail bit collectively with a convolutional code.

25. The data transmission method as claimed in any one of claims 1-24, wherein said error-detecting code is a CRC code.

26. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in a reverse order to each other; and

means for transmitting the generated frame data, and

in a receiver,

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result.

27. The data transmission system as claimed in claim 26, wherein

in the transmitter,

if the number of bits of the transmitted data is zero, said means for calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

in the receiver,

said means for calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position

of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said means for deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

28. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in the same order; and

means for transmitting the generated frame data,

wherein, if the number of bits of the transmitted data is zero, said means for calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

in a receiver,

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein said means for calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said means for deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

29. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged ahead of the corresponding transmitted data; and

means for transmitting the generated frame data,

wherein if the number of bits of the transmitted data is zero, said means for calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code, and

in a receiver,

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed

transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein said means for calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said means for deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

30. The data transmission system as claimed in any one of claims 26-29, further comprising:

in the transmitter,

means for conducting error-correcting coding of the generated frame data; and

means for conducting interleaving of the frame data that has undergone the error-correcting coding, and

in the receiver,

means for conducting deinterleaving of the received frame data; and

means for conducting error-correcting

decoding of the frame data that has undergone the deinterleaving.

31. The data transmission system as claimed in claim 30, wherein

in the transmitter,

said means for generating the frame data generates the frame data containing a tail bit, and

said means for conducting the error-correcting coding conducts the error-correcting coding with a convolutional code, and

in the receiver,

said means for conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence; and

said means for deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a

predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data.

32. The data transmission system as claimed in claim 31, wherein in the receiver, the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

33. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in the same order;

means for conducting error-correcting coding of the generated frame data with a convolutional code;

means for conducting interleaving of the frame data that has undergone the error-correcting coding; and

means for transmitting the frame data that has

undergone the interleaving, and

in a receiver,

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to the assumed final bit position, and at said assumed final bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the

error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference in said means for deciding depends on the assumed final bit position of the frame data.

34. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged ahead of the corresponding transmitted data;

means for conducting error-correcting coding of the generated frame data with a convolutional code;

means for conducting interleaving of the frame data that has undergone the error-correcting coding; and

means for transmitting the frame data that has undergone the interleaving, and

in a receiver,

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

35. The data transmission system as claimed in any one of claims 31-~~34~~, further comprising:

in the transmitter,

means for calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame,

wherein said means for generating the frame data generates the frame data containing the calculated transmission rate information, and

in the receiver,

wherein both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data.

36. The data transmission system as claimed in claim 35, wherein in the transmitter, said means for conducting the error-correcting coding conducts, for the transmission rate information, independent error-correcting coding that is separate from the error-correcting coding for the

transmitted data, the error-detecting code, and the tail bit.

37. The data transmission system as claimed in claim 36, wherein in the transmitter, said means for conducting the error-correcting coding conducts the error-correcting coding of the transmission rate information by using a block code.

38. The data transmission system as claimed in claim 35, wherein in the transmitter, said means for conducting the error-correcting coding conducts the error-correcting coding of all of the transmission rate information, the transmitted data, the error-detecting code, and the tail bit collectively with a convolutional code.

39. The data transmission system as claimed in any one of claims 35~~/37~~38, wherein in the receiver, if said means for deciding does not decide that the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data is the final bit position of the frame data, both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame

data.

40. The data transmission system as claimed in any one of claims 31~~/39~~, wherein in the receiver, if among the assumed final bit positions of the frame data exist a plurality of positions where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data, said means for deciding decides that a position where the obtained likelihood difference becomes the minimum is the final bit position of the frame data.

41. The data transmission system as claimed in claim 30, further comprising:

in the transmitter,

means for calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame,

wherein said means for generating the frame data generates the frame data containing the calculated transmission rate information and a tail bit, and

said means for conducting the error-correcting coding conducts the error-correcting coding with a convolutional code, and

in the receiver,

wherein said means for conducting the

error-correcting decoding assumes the final bit position of the frame data on the basis of the transmission rate information in the received frame data, frame by frame, for the received frame data, and conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and

said means for calculating the error-detecting code assumes the final bit position of the frame data on the basis of the transmission rate information in the received frame data.

42. The data transmission system as claimed in claim 41, wherein:

in the receiver, if said means for deciding does not decide that the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data is the final bit position of the frame data,

said means for conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data

sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said means for deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data.

43. The data transmission system as claimed in claim 42, wherein in the receiver, the predetermined range regarding the likelihood difference at said means for determining depends on the assumed final bit position of the frame data.

44. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code

of the transmitted data, frame by frame;

means for calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame;

means for generating frame data containing the calculated transmission rate information, the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in the same order;

means for conducting error-correcting coding of the generated frame data with a convolutional code;

means for conducting interleaving of the frame data that has undergone the error-correcting coding; and

means for transmitting the frame data that has undergone the interleaving, and

in a receiver,

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position;

means for assuming the transmitted data and the

error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein said means for conducting the error-correcting decoding and said means for calculating the error-detecting code first assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said means for deciding does not decide that the assumed position is the final bit position of the frame data,

said means for conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position,

calculates the likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequences,

both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said means for deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

45. A data transmission system that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

in a transmitter,

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for calculating transmission rate information indicating the number of bits of the transmitted data, frame by frame;

means for generating frame data containing the calculated transmission rate information, the transmitted data, the calculated error-detecting code, and a tail bit such that the error-detecting code is arranged ahead of the corresponding transmitted data;

means for conducting error-correcting coding of the generated frame data with a convolutional code;

means for conducting interleaving of the frame data that has undergone the error-correcting coding; and

means for transmitting the frame data that has undergone the interleaving, and

in a transmitter,

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position

of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with an error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code first assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said means for deciding does not decide that the assumed position is the final bit position of the frame data,

said means for conducting error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates the likelihood difference between the maximum

of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the assumed final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data; and

said means for determining determines that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with an error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

46. The data transmission system as claimed in any one of claims 42-45, wherein in the receiver, if among the assumed final bit positions of the frame data exist a plurality of positions where the obtained likelihood

difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data, said means for deciding decides that a position where the obtained likelihood difference becomes the minimum is the final bit position of the frame data.

47. The data transmission system as claimed in any one of claims 41~~-46~~, wherein in the transmitter, said means for conducting the error-correcting coding conducts, for the transmission rate information, independent error-correcting coding that is separate from the error-correcting coding for the transmitted data, the error-detecting code, and the tail bit.

48. The data transmission system as claimed in claim 47, wherein in the transmitter, said means for conducting the error-correcting coding conducts the error-correcting coding of the transmission rate information by using a block code.

49. The data transmission system as claimed in any one of claims 41~~-46~~, wherein in the transmitter, said means for conducting the error-correcting coding conducts the error-correcting coding of all of the transmission rate information, the transmitted data, the error-detecting code, and the tail bit collectively with a convolutional

code.

50. The data transmission system as claimed in any one of claims 26-49, wherein said error-detecting code is a CRC code.

51. A transmitter that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in a reverse order to each other; and

means for transmitting the generated frame data.

52. A transmitter that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged after the

corresponding transmitted data and bit arrangements of the transmitted data and of the error-detecting code are set in the same order; and

means for transmitting the generated frame data,

wherein if the number of bits of the transmitted data is zero, said means for calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code.

53. A transmitter that puts variable length transmitted data into frames of a fixed time length and transmits these frames, comprising:

means for calculating an error-detecting code of the transmitted data, frame by frame;

means for generating frame data containing the transmitted data and the calculated error-detecting code such that the error-detecting code is arranged ahead of the corresponding transmitted data; and

means for transmitting the generated frame data,

wherein if the number of bits of the transmitted data is zero, said means for calculating the error-detecting code considers a previously-specified bit pattern to be the error-detecting code.

54. A receiver for receiving frame data containing variable length transmitted data, and an error-detecting code calculated, frame by frame, for said transmitted data

in each frame of a fixed time length such that the error-detecting code is arranged after the corresponding transmitted data, and bit arrangements of the transmitted data and of the error-detecting code are set in a reverse order to each other, comprising:

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result.

55. A receiver for receiving frame data containing variable length transmitted data and an error-detecting code calculated, frame by frame, for said transmitted data in each frame of a fixed time length such that the error-detecting code is arranged after the corresponding transmitted data, bit arrangements of the transmitted data and of the error-detecting code are set in the same order, and if the number of bits of the transmitted data is zero,

a previously-specified bit pattern is considered to be the error-detecting code, comprising:

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein said means for calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said means for determining determines that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

56. A receiver for receiving frame data containing variable length transmitted data and an error-detecting code calculated, frame by frame, for said transmit data in each frame of a fixed time length such that the error-detecting code is arranged ahead of the corresponding transmitted data, and if the number of bits of the transmitted data is zero, a previously-specified bit pattern is considered to be the error-detecting code, comprising:

means for receiving the frame data;

means for assuming the transmitted data and the error-detecting code by assuming a final bit position of the frame data, frame by frame, for the received frame data, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein said means for calculating the error-detecting code also assumes a position where the number of bits of the transmitted data becomes zero as the final bit position of the frame data, and

if the error-detecting code when the position where

the number of bits of the transmitted data becomes zero is assumed as the final bit position of the frame data agrees with said previously-specified bit pattern, said means for deciding decides that the position where the number of bits of the transmitted data becomes zero is the final bit position of the frame data.

57. A receiver for receiving frame data containing variable length transmitted data, an error-detecting code calculated, frame by frame, for said transmitted data, and a tail bit in each frame of a fixed time length such that the error-detecting code is arranged after the corresponding transmitted data, bit arrangements of the transmitted data and of the error-detecting code are set in the same order, if the number of bits of the transmitted data is zero, the previously-specified bit pattern is considered to be the error-detecting code, and the frame data has undergone error-correcting coding with a convolutional code and interleaving, comprising:

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at the assumed final

bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

58. A receiver for receiving frame data containing variable length transmitted data, an error-detecting code

calculated, frame by frame, for said transmitted data, and a tail bit in each frame of a fixed time length such that the error-detecting code is arranged ahead of the corresponding transmitted data, if the number of bits of the transmitted data is zero, a previously-specified bit pattern is considered to be the error-detecting code, and the frame data has undergone error-correcting coding with a convolutional code and interleaving, comprising:

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculating a likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed

transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within a predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein the predetermined range regarding the likelihood difference at said means for deciding depends on the assumed final bit position of the frame data.

59. A receiver for receiving frame data containing variable length transmitted data, transmission rate information indicating the number of bits of the transmitted data calculated, frame by frame, for said transmitted data, an error-detecting code calculated, frame by frame, for said transmitted data, and a tail bit in each frame of a fixed time length such that the error-detecting code is arranged after the corresponding transmitted data, bit arrangements of the transmitted data and of the error-detecting code are set in the same order, if the number of bits of the transmitted data is zero, a previously-specified bit pattern is considered to be the error-detecting code, and the frame data has undergone

error-correcting coding with a convolutional code and interleaving, comprising:

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and at the same time the assumed error-detecting code agrees with an error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein both said means for conducting the error-correcting decoding and said means for calculating the

error-detecting code first assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said means for deciding does not decide that the assumed position is the final bit position of the frame data,

said means for conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates the likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said means for deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code

agrees with an error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the likelihood difference at said means for determining depends on the assumed final bit position of the frame data.

60. A receiver for receiving frame data containing variable length transmitted data, transmission rate information indicating the number of bits of the transmitted data calculated, frame by frame, for said transmitted data, an error-detecting code calculated, frame by frame, for said transmitted data, and a tail bit in each frame of a fixed time length such that the error-detecting code is arranged ahead of the corresponding transmitted data, if the number of bits of the transmitted data is zero, a previously-specified bit pattern is considered to be the error-detecting code, and the frame data has undergone error-correcting coding with a convolutional code and interleaving, comprising:

means for receiving the frame data;

means for conducting deinterleaving of the received frame data;

means for assuming a final bit position of the frame data, frame by frame, for the frame data that has undergone the deinterleaving, and conducting error-correcting decoding thereof by the maximum likelihood decoding method

up to said assumed final bit position;

means for assuming the transmitted data and the error-detecting code by assuming the final bit position of the frame data, frame by frame, for the frame data that has undergone the error-correcting decoding, and calculating the error-detecting code of the assumed transmitted data;

means for deciding that among the assumed final bit positions of the frame data, a position where an obtained likelihood difference is within a predetermined range and at the same time the assumed error-detecting code agrees with an error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data; and

means for acquiring the transmitted data on the basis of said decision result,

wherein both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code first assume the final bit position of the frame data on the basis of the transmission rate information in the received frame data, and if said means for deciding does not decide that the assumed position is the final bit position of the frame data,

said means for conducting the error-correcting decoding assumes the final bit position of the frame data, frame by frame, for the received frame data, conducts the error-correcting decoding thereof by the maximum

likelihood decoding method up to said assumed final bit position, and at said assumed final bit position, calculates the likelihood difference between the maximum of likelihoods of a plurality of decoded data sequences that are candidates with respect to the transmitted data sequence and a likelihood of the decoded data sequence obtained by terminating the decoding with respect to the transmitted data sequence,

both said means for conducting the error-correcting decoding and said means for calculating the error-detecting code assume a position other than the final bit position of the frame data assumed on the basis of the transmission rate information in the received frame data as the final bit position of the frame data, and

said means for deciding decides that among the assumed final bit positions of the frame data, a position where the obtained likelihood difference is within the predetermined range and the assumed error-detecting code agrees with the error-detecting code calculated on the basis of the assumed transmitted data is the final bit position of the frame data, and

the predetermined range regarding the likelihood difference at said means for determining depends on the assumed final bit position of the frame data.